

INSTRUCTION MANUAL

ALARM CARD

MODEL ALN-76B

REV. B

CONERENT

COMMUNICATIONS SYSTEMS CORP.

60 COMMERCE DRIVE
HAUPPAUGE, NEW YORK 11788



WARRANTY

Coherent Communications Systems Corporation warrants equipment sold by it to be free from defects in material and workmanship under normal use and service for a period of twelve (12) months after installation or eighteen (18) months after date of delivery, whichever is earlier.

INSTRUCTION MANUAL

ALARM CARD

MODEL ALN-76B

REV. B

The obligation of Coherent to repair or replace, at its option, any equipment which is found to be defective under the terms of this warranty, shall be limited to the replacement of the defective equipment with a new or refurbished unit of equivalent performance. Coherent shall not be responsible for consequential damages in connection with equipment sold by it.

The express warranty made herein shall not be affected if the equipment has been modified without factory authorization or has been subject to misuse, abuse or lack of proper care in use.

No one shall be responsible for consequential damages in connection with equipment sold by it.

Coherent Communications Systems Corp.
60 Commerce Drive
Hauppauge, New York 11788

Telephone: (516) 231-1550
(212) 895-6316

Cable Address: COHERENT, CENTRAL ISLIP
Telex: 96-1439

EQUIPMENT WARRANTY

Coherent Communications Systems Corporation warrants equipment sold by it to be free from defects in material and workmanship under normal use and service for a period of twelve (12) months after installation or eighteen (18) months after date of delivery, whichever shall occur first.

The obligation of Coherent hereunder is limited to repair and/or replacement of any defective part or parts, provided the same are returned, transportation and insurance charges prepaid to the nearest authorized representative within the period of this warranty.

The express warranty made herein shall not be effective if the equipment has been modified without factory authorization or has been subject to misuse, abuse or lack of reasonable care in its use.

In no event shall Coherent be responsible for consequential damages in connection with equipment sold by it.

INSTRUCTION MANUAL

MODEL ALN-76B

INDEX

<u>Title</u>	<u>Page</u>
I. GENERAL	1
1. Minor Alarm	1
2. Major Alarm	3
Functional Diagram, Figure 1	
II. SPECIFICATIONS	4
III. THEORY OF OPERATION	5
1. Minor Alarm Circuit	5
2. Major Alarm Circuit	6
IV. INSTALLATION INSTRUCTIONS	8
1. Mechanical	8
2. Power Connections	8
3. Monitor Connections	8
4. Edge Connector Pl Terminations	9
5. Strapping	9

ILLUSTRATIONS

DRAWING NUMBER

Schematic Diagram

C ALN-76B-05

P.C. Board Assembly

B ALN-76B-25

I. GENERAL

The Coherent Communications Alarm Card Model ALN-76B normally operates in conjunction with the Coherent FSM-76 modem series. Its function is to furnish visual indications of various alarm conditions which include carrier alarm, equipment power supply and loop power supply failures.

A "Remote Alarm" reed relay and "Alarm Disable" switch are provided for control of an external alarm circuit.

Minor and Major alarms are the result of the following failure modes:

1. Minor Alarm

(Ref. Figure 1)

A Minor Alarm condition exists when any one modem channel alarm input to the alarm module is grounded. This condition causes the Minor Alarm LED indicator to light. The remote alarm relay K1 will simultaneously release if strap 'A' is inserted. Relay K1 will otherwise release in the "Major Alarm" mode (strap "B") only.

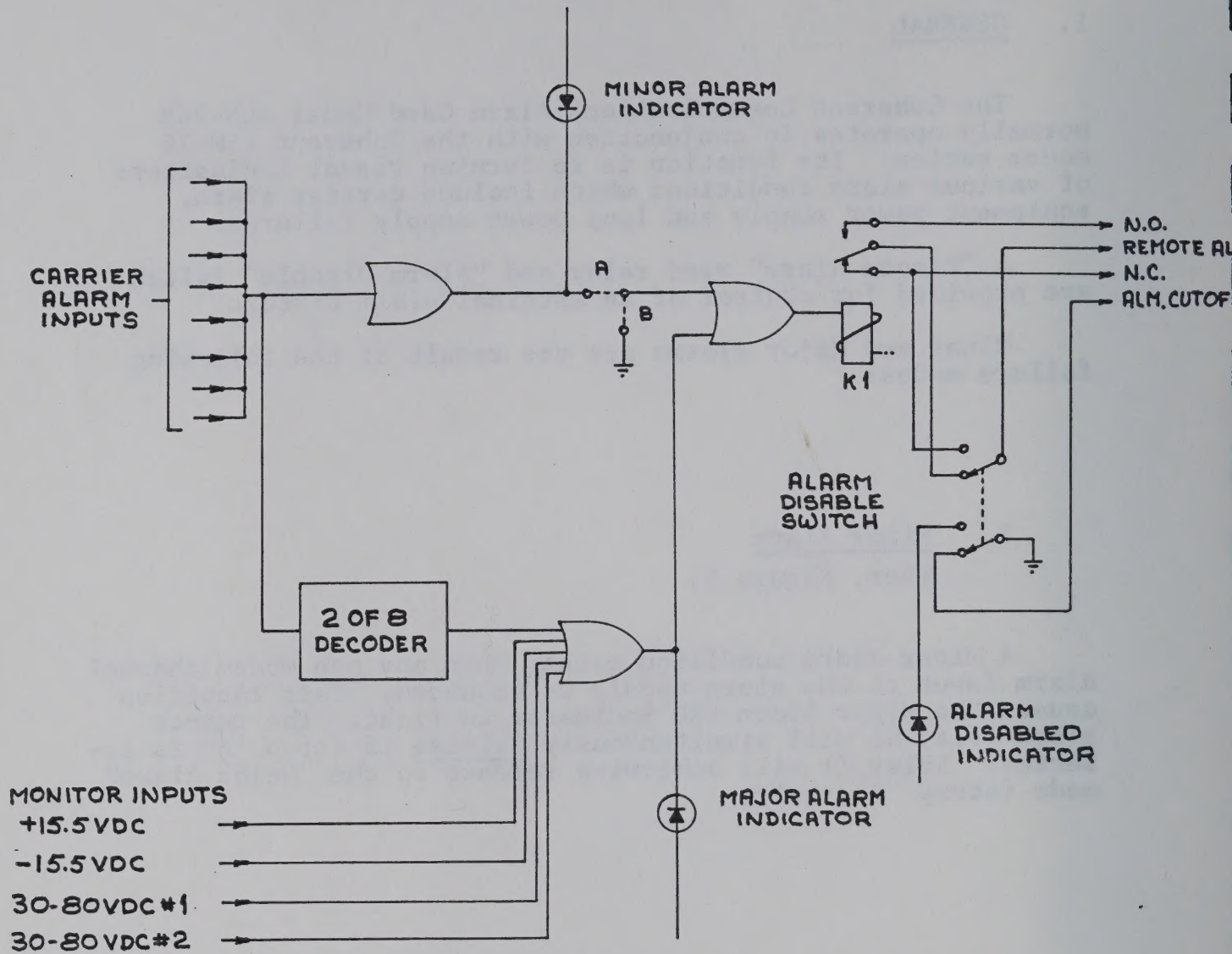


FIGURE 1. SIMPLIFIED BLOCK DIAGRAM, ALARM MODULE ALN-76B

2. Major Alarm (Ref. Figure 1)

The Major Alarm mode exists when any of the following conditions are met:

- a. Two or more carrier alarm inputs to the alarm module are grounded.
- b. Loss of +15.5VDC equipment power.
- c. Loss of +5.5VDC equipment power.
- d. Loss of -15.5VDC equipment power.
- e. Loss of loop supply voltages.

When a major alarm condition exists, the Major Alarm LED indicator flashes at an approximate one second rate and the remote alarm relay (K1) will release. If the alarm condition is caused by carrier level loss, the minor alarm LED indicator will also light. Alarm disable lead terminations for the -15.5VDC supply monitor circuit and the loop supply monitor circuits are furnished to allow the ALN-76 module to be utilized in systems that do not include these voltages.

The "Remote Alarm" disable switch is wired to provide a ground termination to the Alarm Cutoff lead in the "Normal" position.

When the switch is in the "Disabled" position, the ground is applied to the "Remote Alarm Disabled" LED indicator instead. With the switch in this position, it holds the "Remote Alarm" relay N.O. contact path open and the N.C. contact path closed.

II. SPECIFICATIONS

General:

Normally used in conjunction with Frequency Division Multiplex Systems containing Coherent Model FSM-76 modems.

Carrier Alarm Facilities:

Minor and Major carrier failure recognition.

1. Minor Alarm:

One channel carrier alarm input grounded.

2. Major Alarm:

Two or more channel carrier alarm inputs grounded.

Equipment Power Supply Monitoring Facilities:

Positive 5.5VDC monitor input.
Positive 15.5VDC monitor input.
Negative 15.5VDC monitor input.
Negative 15.5VDC monitor disable input furnished.

Loop Supply Monitoring Facilities:

Monitor inputs for two loop supplies (isolated) Voltage range 30VDC to 80VDC. Loop alarm disable input furnished.

Alarm Indicators:

Major Alarm LED, RED.
Major Alarm LED, Flashing RED.
Alarm Disable LED, AMBER.

Connections:

22 pin edge connector P1, single sided.

Power Requirements:

+5.5VDC @ 150ma.
+15.5VDC @ 15ma.

Dimensions:

Height: 4-1/2" (115mm)
Width: 11" (280mm)
Depth: 1-1/8" (30mm)

Approximate Weight:

11 oz. (312g)

III. THEORY OF OPERATION

(Ref. Dwg. ALN-76B-05)

1. Minor Alarm Circuit

The minor alarm circuit is comprised of a eight input NAND gate AG1, part of inverter IN1, LED indicator I1 and part of NOR gate NG1 which controls the remote alarm reed relay K1 through associated circuitry.

a. No Alarm

All inputs to NAND gate AG1 are high and its output is low when a "No Alarm" condition exists at the channel carrier alarm inputs.

The AG1 output is inverted by IN1 and the resultant high applied to the cathode of LED I1 holding it in the "off" state.

The low output of AG1 is also applied to NOR gate NG1 pin 11 via strap "A". Strap "B" provides a constant low to NG1 pin 11 when inserted. A low, from the major alarm logic is present on NG1 pin 12. NOR gate NG1 is inactive and its output is high causing transistor Q2 to conduct.

Positive 15VDC is brought through relay coil K1 via R23 and transistor Q2. Diode D4 is provided for transient protection.

b. Alarm Condition

A minor alarm condition occurs when a ground is applied to any one input of NAND gate AG1 causing its output to become high. The inverter output IN1, pin 6 goes low, allowing LED I1 to light.

The high output of AG1 is also applied to pin 11 of NOR gate NG1, via strap "A" which in turn provides a ground to the base of transistor Q2. Q2 turns off, thereby releasing relay K1.

When strap "B" is inserted instead of strap "A" the input pin 11 of NOR gate NG1 remains low holding relay K1 operated via transistor Q2.

2. Major Alarm Circuit

The Major Alarm circuit is comprised of five sensor circuits and an eight input NAND gate AG3. The output of AG3 controls an oscillator circuit which pulses the Major Alarm LED indicator at an approximate one second rate. The AG3 output also controls the remote alarm relay K1 through NOR gate NG1 and transistor Q2. The sensor circuits function as follows:

a. Major Carrier Alarm Circuit

A major carrier alarm condition is detected by a 2 of 8 decoder which is comprised of inverters IN1 and IN2, NAND gates AG4, AG5 and AG7, NOR gates NG1 and an eight-input NAND gate AG2. The decoder is designed to operate only when two or more channel carrier alarm inputs are grounded. When this occurs NAND gate AG2 output becomes high. This logic level is inverted by part of AG7. The resultant low is brought to pin 11 of the major alarm NAND gate AG3 which controls the oscillator circuit for the major alarm LED indicator and the remote alarm relay K1.

b. +15.5VDC Monitor Circuit

When +15.5VDC equipment power is present, transistor Q1 conducts and presents a ground to part of NAND gate AG6, which is wired as an inverter. If the +15.5VDC is lost, transistor Q1 turns off and the output of AG6 furnishes a low to the input of NAND gate AG3, pin 12.

c. -15.5VDC Monitor Circuit

Negative 15.5VDC to connector P1 pin 15 holds part of NAND gate AG6 inactive and its output pin 11 provides a high to NAND gate AG3 input pins 3 and 4. If -15.5VDC is lost, the AG6 output furnishes a low to the AG3 input. It should be noted that if a ground is applied to the -15.5VDC "Alarm Disable" input, P1 pin 16, NAND gate AG6 output pin 11 provides a constant "no alarm" high to NAND gate AG3.

d. Loop Supply Monitor Circuits

There are two identical loop supply monitor circuits provided on the alarm module. Each circuit consists of an opto-isolator with associated circuitry and part of NAND gate AG6. Note that the loop alarm disable circuit will disable both monitor circuits when ground is applied to pin 13 of connector P1.

Each loop supply monitor circuit is designed to operate within an input voltage range of 30VDC to 80VDC. If higher input voltages are used, the monitor input circuits must be wired in series. Proper input polarities must be observed.

As long as loop supply voltages are present, the output of the opto-isolator(s) provide a ground to part of NAND gate AG6. NAND gate AG6 output pin (s) 6 and 3 provide a low to NAND gate AG3 if loop supply voltages are lost.

e. +5.5VDC Monitor Circuit

If the +5.5VDC equipment power input to the module is lost, all logic elements will cease operation, however the major alarm oscillator circuit will continue to operate. The voltage necessary to operate the oscillator circuit and the associated major alarm LED is brought from +15VDC through diode D4 and zener diode D8. The remote alarm relay K1 will release.

If both +15.5VDC and +5.5VDC equipment power are lost, the alarm module will be effectively non-functioning, however, a remote alarm (externally furnished) can operate through relay K1 contacts.

IV. INSTALLATION INSTRUCTIONS

1. Mechanical

The ALN-76B Alarm Module circuitry is contained on a single printed circuit glass epoxy board 4-1/2" high, 11" wide and 1-1/8" deep. The module is designed to plug into an EQH-() series equipment housing. When mounted all electrical connections are made through printed circuit board connector P1.

2. Power Connections

(Ref. Dwg. ALN-76B-05)

External DC equipment power is brought into the module through edge connector P1 pin 5 (+15.5VDC), pin 14 (+5.5VDC) and pin 10 (ground).

3. Monitor Connections

(Ref. Dwg. ALN-76B-05)

All monitor connections are brought into the module through edge connector P1 per the following connection list "Edge Connector P1 Terminations".

4. Edge Connector Pl Terminations

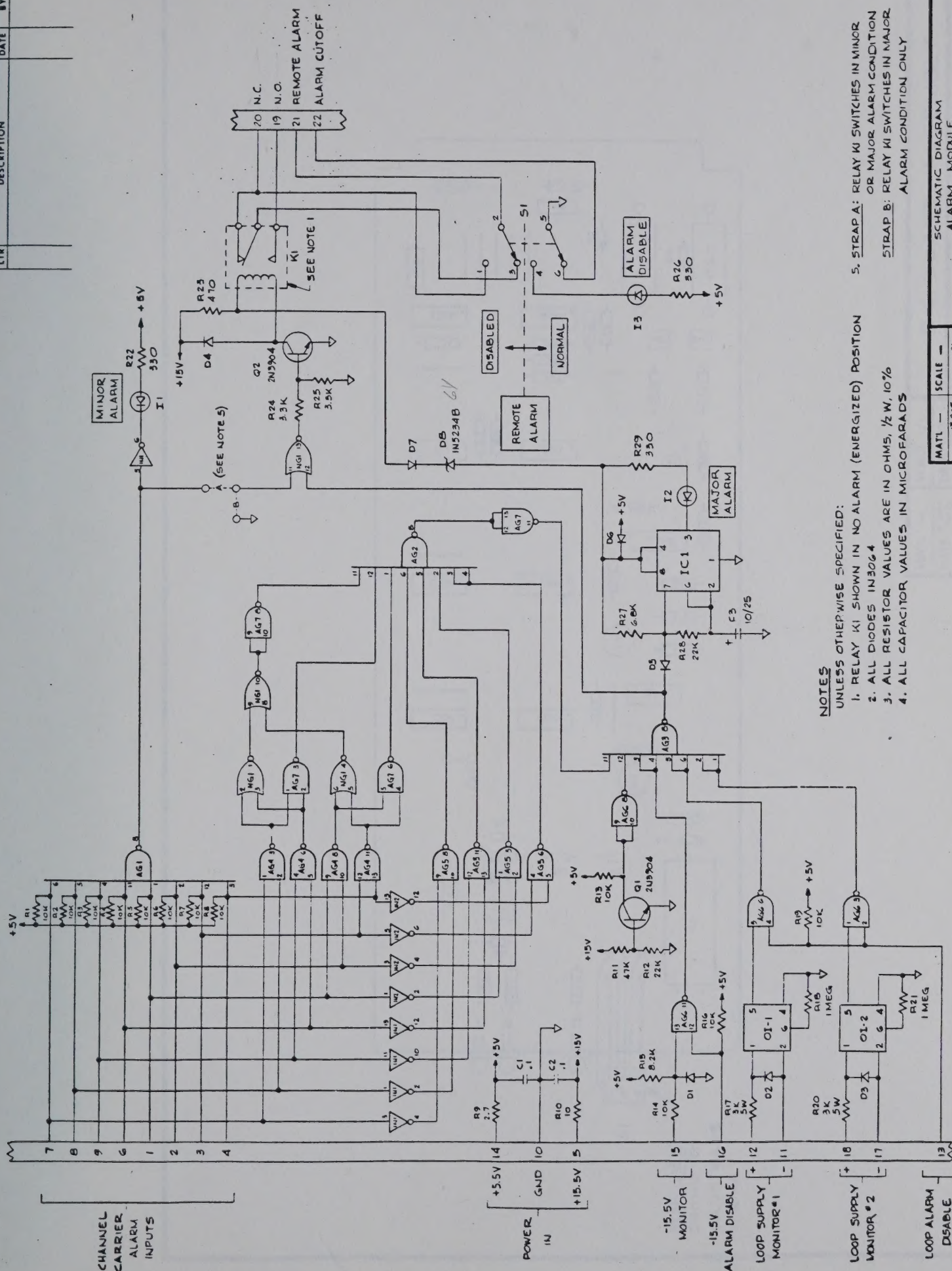
<u>Pin Number</u>	<u>Function</u>
1	
2	
3	
4	Channel Carrier Alarm Inputs
6	
7	
8	
9	
5	+15.5 VDC equipment power input.
10	Equipment power ground.
14	+5.5 VDC equipment power input.
12	Loop supply #1 monitor, pos. input
11	Loop supply #1 monitor, neg. input
18	Loop supply #2 monitor, pos. input
17	Loop supply #2 monitor, neg. input
13	Loop alarm disable input.
15	-15.5VDC monitor input.
16	-15.5VDC alarm disable input.
19	*N.O. remote alarm contact (K1).
20	*N.C. remote alarm contact (K1).
21	Remote Alarm (tongue K1).
22	Remote Alarm disable.

* Note: The N.O. and N.C. designations refer to contact conditions when NO alarm exists and relay K1 is energized.

5. Strapping

Insert strap 'A' to provide a remote alarm condition (K1 released) for both "Minor" and "Major" alarm modes.

Insert strap 'B' to provide a remote alarm condition (K1 released) for the "Major Alarm" mode only.



NOTES

UNLESS OTHERWISE SPECIFIED:

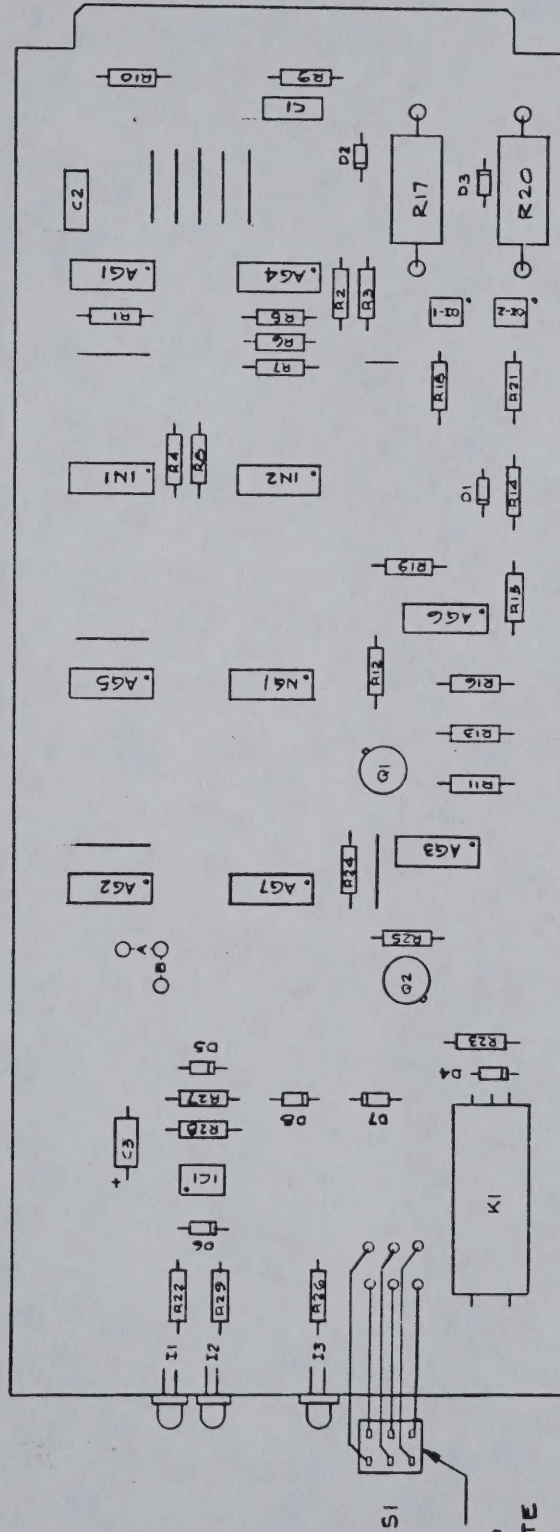
1. RELAY KI SHOWN IN NO ALARM (ENERGIZED) POSITION

2. ALL DIODES IN 3064

3. ALL RESISTOR VALUES ARE IN OHMS, $\frac{1}{2}$ W, 10%

4. ALL CAPACITOR VALUES IN MICROFARADS

5. STRAP A: RELAY KI SWITCHES IN MINOR
OR MAJOR ALARM CONDITION
STRAP B: RELAY KI SWITCHES IN MAJOR
ALARM CONDITION ONLY



MAT'L DATE 19 OCT 1975 APPD <i>[Signature]</i>	SCALE 1/1 DRAWN <i>[Signature]</i> SHEET 1 OF 1	P.C. BOARD, ASSEMBLY COHERENT COMMUNICATIONS SYSTEMS CORP. ALN-76B-25	REV A
--	---	--	------------------

